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Acceleration of investment through the stabilization of money

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A R T I C L E I N F O

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A B S T R A C T

Indonesia downfall as represented in the economic crisis is due to the inability of the government to restore the pre-crisis level of investment in 1997. This could happen although the government has enforced Law No. 1 of 1967 Jo No 11 of 1970 on Foreign Direct Investment (FDI) and Law No. 6 Years 1968 Jo No 12 Year 1978 on Domestic Investment (DCI). This study attempts to reveal whether the investment is quite effective in accelerating investment through the stabilization of money. This is very important because the stabilization of money can raise investments, which finally affect greatly the condition of the state economy. The data were collected from 1970 to 2012. Econometric model is employed for testing the hypotheses because it can handle the mutual dependence (interdependence). Besides that, econometric model is an invaluable tool for understanding the way the economic system works and so to test and evaluate policy alternatives. Hypothesis is tested using multiple regressions with Two Stages Least Square method. The result shows that the stabilization of money could accelerate the investment by looking at the intermediate indicators on the exchange rate. However, it cannot be seen through the indicators of inflation.

A B S T R A K

Terpuruknya Indonesia yang tergambar dalam krisis ekonomi disebabkan oleh ketidakmampuan pemerintah untuk mengembalikan tingkat pra-krisis investasi pada 1997. Hal ini terjadi pada saat itu meskipun pemerintah memberlakukan Undang-Undang Nomor 1 Tahun 1967 Jo No 11 Tahun 1970 tentang Penanaman Modal Asing (PMA) dan Undang-undang Nomor 6 Tahun 1968 Jo No 12 Tahun 1978 tentang Penanaman Modal Dalam Negeri (PMDN). Studi ini berusaha menemukan apakah investasi ini cukup efektif dalam mempercepat investasi melalui stabilisasi uang. Hal ini sangat penting karena stabilisasi uang dapat meningkatkan investasi, yang pada akhirnya berpengaruh pada kondisi perekonomian negara. Data dikumpulkan 1970-2012. Model ekonometrik digunakan untuk menguji hipotesis karena dapat menangani saling ketergantungan (interdependence). Selain itu, model ekonometrik adalah alat yang sangat berharga untuk memahami cara sistem ekonomi bekerja dan sebagainya untuk menguji dan mengevaluasi alternatif kebijakan. Hipotesis ini diuji dengan menggunakan regresi berganda dengan dua tahapan metode (Two Stages Least Square). Hasilnya menunjukkan bahwa stabilisasi uang bisa mempercepat investasi dengan melihat indikator menengah pada nilai tukar. Namun, tidak dapat dilihat melalui indikator inflasi.

1. INTRODUCTION

It has been noted that developing countries still have low-level welfare population. For that reason, economic growth is required for catching up to be industrialized countries. The weakness of private participation ability in economic development requires the government to take a role as a driving force of national economic development. Indonesia downfalls in as represented in economic crisis is due to the inability of the government to restore the pre-crisis level of investment in 1997 although the government has enforce Law No. 1 of 1967 Jo No. 11 of 1970 on Foreign Direct Investment (FDI) and Law No. 6 Years 1968 Jo No 12 Year 1978 on Domestic Investment (DCI). Yet, the results were not satisfactory.

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Indonesia is currently trying to improve and recover economic growth after experiencing economic crisis. In addition, the globalization which could also pose a threat to developing countries has relatively several flaws in the economic sector in terms of capital, human resources and technology mastery. Various efforts to promote and enhance the investment activities as a source of sustainable economic growth in the long term have been made by the government. Increasing the value of existing investments will reduce unemployment, since the higher the unemployment rate the higher the poverty rate. This would result in lower income communities and especially will reduce national income.

There are several factors which can cause investments, but these do not progress as expected. These factors are economic and non-economic factors. Non-economic factors include political conditions, security factors and policy bureaucracy, while the economic factors include the stability of the circulating money. The stability of the money supply becomes an important concern in controlling the economy.

Some studies prove that money supply has no effect on the exchange rate (Shehan, Richard G and Mark E. Wohar 2001). Another evidence is by Maitra and Chandan (2011) and Atmadjaya (2003) found that the increase in the money supply will cause a depreciation in the exchange rate. Also, Nuci and Alberto (2001) proved that exchange rate fluctuation affect the investment. Besides that, the growth of the money supply also increases inflation (Nelson 2008), while according to Madsen (2003) inflation will affect the investment. Based on these previous studies, it appears that the amount of money or the money supply affects inflation and the exchange rate, which finally lead to inflation and the exchange rate that also affect the investment. Thus, when the stability of the money supply is not controlled well, it will cause investment to be slow and if this condition is left it eventually affect the existing economic conditions.

2. THEORETICAL FRAMEWORK AND HYPOTHESIS

In general, money is anything that serves as accepted medium of exchange. The most important concept is the narrow money, or M1, which is the number of coins and banknotes in circulation outside banks and the deposit money that can be availed. Another important monetary aggregate is broad money (M2), which consists of assets such as savings accounts plus coins, banknotes and deposits which can be turned into checks (Samuelson 2004:189-190). M1 money is the most liquid, because the process to turn it into cash is fast and without any value loss, while M2 because it includes time deposits, has lower liquidity compared to M1 (Nopirin I 2007:3). Money in the narrow sense (denoted by M1) consists of currency that is outside the monetary system (outside the central bank, the government, and the creator of the banks demand deposits) and demand deposits *(demand deposits).*

$$M1 = C + D \quad (1)$$

The money in the broad sense (*M2*) consists of *M1* and queasy-money (time and savings deposits) in banks which create deposits.

$$M2 = M1 + TD \quad (2)$$

For the ease of the presentation, as well as to temporarily ignore the distinction between *demand* deposits and time deposits so that the equation (1) and (2) will become:

$$M = C + D \quad (3)$$

In an economy, every time *monetary base or reserve money* (*RM*) exists, which is determined by the size *of net foreign assets* held by the central bank (*NRA*), clean bill to the government (*NCG*), bill on the banks (*CB*), bill to the private sector (*CP*), and other net assets (*NOI*). For the easy presentation, it is considered that the central bank does not provide loans directly to companies and individuals, as well as the *NOI* is zero.

So the equation of the *monetary base* is the supply side (Pohan 2008: 32)

$$RM^s = NFA + NCG + CB \quad (4)$$

Except the *NFA*, the central bank can set the NCG and CB within certain limits. NFA held by central banks in general will change according to changes in the balance of payments (Pohan 2008: 33)

$$NFAt = NFAt\text{-}1 + OB \quad (5)$$

In this case, *OB* is *overall surplus* or balance of payments deficit. Base on demand, *monetary base* consists of currency held by the public who wish to reserve the wanted and owned by the creator of the banks demand deposits (*R*) (Pohan 2008:33)

OB is the *overall* balance of payments *surplus* or deficit. On the demand side, *the monetary base* consists of currency which is owned by the public and reserved owned by the creator of the demand deposits banks (*R*) (Pohan 2008:33).

$$RM^d = C + R \quad (6)$$

Reserve banks consist of *required reserve* and *excess reserve* (Pohan 2008:33)

$$R = RR + ER \quad (7)$$

By combining equation (2), (3) and (5), follow-

ing equation will be obtained:

$NFA + NCG + CB = C + RR + ER$ (8)

It is, in which, *CB* was transferred to the right hand side of the equation and directly to reduce *ER*, free reserve will be obtained.

$NCG + NFA = C + RR + FR$ (9)

Based on equation (4), equation can be obtained, namely (Pohan 2008:33):

$$C = \frac{(\lambda)}{(1+\lambda)} M \cdot \quad (10)$$

In this case, it is the ratio of currency to deposits $\frac{(C)}{D} = \lambda$ because some people hold their money in the form of deposits.

At all times banks are required to maintain *reserve requirement ratio* by k percent of the savings accounts of its customers. Thus, the equation of the *reserve requirement ratio* is (Pohan 2008:34):

$RR = kD$ (11)

From equation (11) and (4), following equation can be obtained:

$$C = \frac{(\lambda)}{(1+\lambda)} M \cdot \quad (12)$$

By substituting equation (11), (12) and (13) into equation (10), it can be obtained:

$$NFA + NCG = \frac{(\lambda)}{(1+\lambda)} M + FR \cdot \quad (13)$$

Commercial banks provide loans with interest rate markets (*r*) and borrow from the central bank through the *discount window* at an interest rate (*rd*). If there is an interest increase which are relatively higher than the increase, banks tend to reduce *excess reserve* and increase borrowing from the central bank. So *FR (free reserves)* is a function of the difference between the interest rate *r* and *rd*. (Pohan 2008:34)

$FR = f(r - d)$ (14)

By substituting equation (15) into (14) then we obtain the equation:

$$M = \frac{(\lambda)}{(1+\lambda)}(NFA + NCG) - \frac{(\lambda)}{(1+\lambda)} f(r - rd) \cdot \quad (15)$$

Equations 15 is money stock equation, which amount is influenced by the behavior of, 1, *k, NFA* + *NCG, r* and *rd*. Equation 15 shows how the central bank can control the money supply by using monetary instruments, namely *open market operations, reserve* and *discount facility required. Open market operation* executed by purchasing government bonds by the central bank will lead to a rise in the *NCG* which also means an increase in *the monetary base,* which is then increase *the supply of money*. On the contrary, the government bonds sale by the central bank will reduce the *supply of money* and *RM*.

The increase of reserve requirement ratio (k) will reduce the multiplier so that *the supply of money* decreases and the other way around a decrease in k will increase the *supply of money*. Through *discount policy,* which is increasing, it will reduce the banks borrow from the central bank which in turn will inhibit the ability of banks to provide loans to the private sector. This will result in reducing the money supply. Instead, rd decreasing would encourage banks to borrow from the central bank, which in turn will increase the money supply.

Monetary policy is not something that stands alone, but there is interdependence of the various variables in economic activities. On one hand, monetary policy is influenced by various factors in the economy, on the other hand also monetary policy directly affects the monetary and financial conditions that will in turn had an impact on the real sector condition.

Monetary policy is a policy that has been defined and implemented by *Bank Indonesia* to achieve and maintain *rupiah* stability which is done through controlling the money supply and or interest rates. In a closed economy of a country, the country's economy do not have any interaction with other economies, the monetary policy implemented will be simpler.

Generally, there are two kinds of policies, which are expansionary monetary policy also called *easy money policy* by increasing the money supply *(money supply)* and the policy that is contractive or *tight money policy*, which is done by reducing the circulating money *(money supply)*. Expansionary monetary policy that is conducted by Bank Indonesia is generally taken during periods of unemployment and the national production capacity has not been in full use. Instead, the contractive policy generally done at states of *over-employment economy,* the state in which demand exceeds the aggregate amount of the national production capacity, the state is generally characterized by high rates of inflation.

Positively, public still has an understanding that government policy over monetary and banking sector has more power than what can effectively be achieved through the instrument. Based on this assumption it is assumed that monetary sector and banking sector has a function that can provide for the continuity of the real sector, investment, production, distribution and consumption activity.

The relationship between Money and Inflation

There are several reviews on the theory of inflation (Atmadjaya 2003):

Quantity Theory

This theory was developed by the classical economists *David Hume* in Lucket (1994), stating that the amount of money in circulation was positively correlated to changes in the price level (inflation). If governments implement expansionary policies to increase the amount of money in circulation, then it will affect the increase in the inflation, rate and vice versa. The correlation between the amount of money in circulation and the amount of the price level is proportional, meaning that if the money supply rises 3 times the price level will also increase by 3 times.

The monetary theory contains a weakness because some aspects do not take into consideration, those aspects are money velocity *(velocity of money),* the circulation of goods and services and interest rates. Yet on the other hand, the demand for money *(money demand)* is determined by the amount of revenue *(income)* and the amount of the interest rate. The assumption of the quantity theory is that the money is used solely for the benefit of the transaction, the speed of circulation of money *(velocity of money)* and the economy is still in a state of *full employment* (Lucket 1994:439)

The core of this inflation theory can only occur if there is additional money, both currency and demand deposits. Besides that, the inflation rate is also determined by the rate of increase in the money supply and community expectations regarding price increases in the future.

Keynes Model

The rationale of this theory was caused by people who want to live beyond their economic capabilities, resulting in effective public demand for goods (aggregate demand) exceeds the amount of goods available (aggregate supply), this will result in the *inflation gap*. Limited number of inventory items is caused by the short-term production capacity cannot be developed to offset the increase in aggregate demand.

Mark-up Model

The rationale of the theory of inflation is determined by two components, namely the *cost of production and profit margins.* Changes in the relationship between the two components can be formulated as follows:

Price = Cost + Profit Margin (16)

Because of the large profit margin is usually specified as a percentage of total *cost of production,* then the formula can be translated into:

Price = Cost + (a% x Cost) (17)

Based on these similarities, it can be explained that if there is an increase in the price of the components that make up the *cost of production* and or increase in *profit margins*, it will cause an increase in the selling price of commodities in the market.

Structural Theory

According to this theory, inflation in developing countries is not solely a monetary phenomenon, but also a structural phenomenon or *cost push inflation.* This is because the economic structure of developing countries in general are still agrarian nature, so that the economic shock which come from domestic sources, such as crop failures or things that have to do with foreign relations, e.g., worsening *terms of trade,* foreign debt, and foreign exchange rates, can cause fluctuations in the price of the domestic market.

Currency Effect on Inflation

First theory between of money and inflation is put forward by Fisher's through theory of money quantity (Smithin 2003:42). This theory is the base of the monetary policy in transmission of mechanism study, which is direct, the money supply and its growth is the main cause of inflation (Marshall *and* Swanson 1980: 370).

People hold money to buy goods and services. The more money that is needed for the transaction the more money that is held. Therefore, the quantity of money in the economy is very closely related to the amount of money exchanged in the transaction. According to the quantity theory of inflation, the main cause of the emergence of excess demand is caused by the increase in the money supply. Quantity Theory explains that the main source of inflation is due to an excess of money in circulation is multiplied (Khalwaty 2000:15-31).

Classical theory of money demand stems from the theory about the amount of money circulating in the community. This theory is not meant to explain why a person or people are putting cash money, but rather on the role of money in the economy. In a simple classical theory of money demand, equation in the form of exchange or *The Equation of Exchange* is the disclosure of *the Quantity of Money* of the ideas of American economic thinker Irving Fisher (1867-1947) in Mankiw 2003:78.

The relationship between the transaction and the money is shown in the following equation, called the equation of quantity *(quantity equation):*

$M \; X \; V = P \; X \; T$ (18)

Based on equation (2), it can be explained that the right sideof the quantity equation tells transac-

tions *(PT)*. *T* denotes the total number of transactions during a given period, e.g. a year. In other words, *T* is the number of times a year for goods and services in exchange for money. *P* is the price of a particular transaction amount of money exchanged. Products from the transaction price and the number of transactions are *PT*, equal to the amount of money exchanged in a year.

The left side of the quantity equation states that the money is used for transactions *(MV)*. M is the quantity of money. *V* is the velocity of money *(transactions velocity of money)* and measures the rate at which money circulates in the economy. In other words, the velocity tells us the number of times money changes hands in a given period of time (Mankiw 2003:78-79).Besides, the above formulation is not a function but is an equation that indicates the balance between the left side and the right hand side. Based on the above formulation, it can be seen that *P* (inflation) is influenced by several factors, namely *M (money in circulation)*, V *(velocity of money)* and T *(the volume of trade)*. So the above formulation can be written as:

$$P = \frac{MV}{T}. \quad (19)$$

The equation above is known as *Transaction variant* that shows that 3 factors that affect the general price level are the money supply *(M)*, velocity of circulation of money *(V)* and the volume of transactions *(T)*. Formulation above also hints at the motive of money demand for transactions as essential part of the classical monetary theory about *the transaction demand for money*. Money demand requires increasing if the need to increase the money for the transaction is associated with the large volume of trade. The advantage of holding money is liquid because of its ease to perform transactions (Yuliadi 2008:42)

Because the large number of transactions is difficult to measure, the problem *T* is replaced with the total *output* of the economy is *Y*, so that the Theory of Money Quantity can be written as follows:

$$M \times V = P \times Y. \quad (20)$$

Description:
M is the money supply,
V is level of velocity (the velocity) of money which is assumed constant,
P is the general price index,
Y is real income.

Since *Y* is also the total income, *V* is a version of the quantity equation, which is called the income velocity of money. Income velocity of money stated how many times the money goes into a person's income in a given period. Money demand function is an equation that shows what determines the quantity of real money balances people want to be detained.

Simple money demand equation is:

$$(M/P)^d = kY \quad (21)$$

Where *k* is a constant that tells how much money you want to detained persons for each income (IDR/USD). This equation states that the quantity of real money balances demanded is proportional to real income (Mankiw 2003:80). Researchers who conducted the same studies are such as Budina et al. (2006) and Power (2005). They concluded that the increase in the money supply can elevates the rate of inflation, in addition, to the research on the effect of money supply on inflation is also supported by previous research conducted by English (1999), and Aiyagatri et al. (1998).

Money and Money Exchange Rate

Monetary approach states that the foreign exchange rate as the relative price of two currencies is determined by the balance of demand and supply of money. Monetary approach basically consists of two versions, namely the flexible price version *(flexible price version)* and the sticky price version *(sticky price version)*. Sticky-price version appeared as a result of criticism of the price flexibility in the flexible price version.

According to this version, the perceived rigidity is more realistic when it comes to a short period (Ronald MacDonald: 1990).Sticky-price version of the Keynesian approach is often referred to the supposition of the variables in the money supply is endogenous. The second assumption is not acknowledging the effectiveness of market mechanisms to resolve imbalances that occur in the short-term money market.

The theory of the exchange rate with the monetary approach is combination of the quantity theory of money with the determination of the exchange rate.

Mathematically it can be formulated as follows (Yuliadi 2008:62):

$$\frac{M}{P}V(r,Y) = Y\,, \quad (22)$$

In which:
M is the number of nominal money
P is the price level
r is the interest rate
Y is real national income

The equation above indicates that the acceleration of circulation of money is a function of the interest rate and real national income, which in turn

will determine the rate of economic growth. So the above equation can be reformulated into (Yuliadi 2008:62):

$$P = V\frac{M}{Y} \quad (23)$$

The equation above shows that the increase in the money supply will proportionally increase the price. According to the theory of PPP *(Purchasing Power Parity)* that the magnitude of the price level is equal to the magnitude of the foreign price level (P *) which is converted into the magnitude of the exchange rate (E) can be formulated as follows (Yuliadi 2008:62)

$$P = P^*E \quad (24)$$

Therefore, by combining those equationsabove, itcan beformulated into the following equation (Yuliadi 2008: 63):

$$E = (1/P^*)V\frac{M}{Y} \quad (25)$$

The above equation shows that the balance exchange rate is determined by the nominal amount of money, the level of real *output* and the velocity of money circulation. The increase in nominal money and velocity of circulation of money will decrease exchange rate proportionally, while an increasing number of real *output* will increase the exchange rate.

The amount of the exchange rate (E) more completely is determined by the amount of money in relative terms, the acceleration of the circulation of money and real income between the two countries. The explanation can be formulated mathematically as follows: (Yuliadi 2008:63)

$$E = \left(\frac{M}{M^*}\right)\left(\frac{V}{V^*}\right)\left(\frac{Y}{Y^*}\right) \quad (26)$$

$$V = V^{\lambda-1}\exp(\theta r) \quad (27)$$

And acceleration of money circulation is determined by the amount of real income alternative cost of holding money that can be formulated as follows (Yuliadi 2008:63):

$$e = m - m^* - \lambda(y - y^*) + \theta(r - r^*) \quad (28)$$

By substituting the previous equation, it is obtained a formulation that describes the determination of the exchange rate according to the monetary approach, namely (Yuliadi 2008:63):

In which the variable e, m, m *, y and y * is formulated in the form of logarithms. Determination of the balance exchange rate or the expected long-term balance exchange rate (E) is a function of the terms of trade and the long-term price level, thus formulated as follows (Yuliadi 2008:63):

$$\overline{E} = 1()\frac{\overline{P}}{\overline{P^*}} = 1()\frac{p\overline{M}}{s^*M^*} \quad (29)$$

The equation above explains that the amount of the exchange rate is determined by the amount of money proportional and proportional factors are also influenced by exogenous variables. The formulation of balance exchange rate can then be formulated as follows (Yuliadi 2008:63):

$$E = \frac{s()(p\overline{M}/p^*\overline{M}^*)}{1 + r(M/P,Y) - r^*} = E(s, M/P, Y, p, p^*, \overline{M}, \overline{M}^*) \quad (30)$$

Increasing the amount of money in the long term in which the flexible price level will increase the price and exchange rate proportionately. Unlike the trading approach or approaches that emphasize the intensity of the elasticity of trade in goods and services between the two goods in explaining the change in the exchange rate between two currencies of the two countries.

Currency Effect on Exchange Rate

In the monetary approach *(monetary approach)*, it is stated that currency exchange rate is created from the equality or the rebalancing of stock or the total demand and supply of the currency of each country. A country's money supply is determined by the monetary authority, but the demand for money is determined by the level of real income, the prevailing price levels and interest rates. The higher the level of income and the price level the higher demand for money by individuals and companies to finance economic transactions carried purposes will be. However, if the interest rate is higher the demand for money is getting lower because the cost of storage opportunity cash is becoming more expensive. Therefore, there is an inverse relationship between the amounts of the interest rate and the demand for money (Yuliadi 2008:64)

If the government increases the money supply, they will decrease the interest rates and stimulate foreign investment. This causes capital outflows at the time foreign exchange rates rise (appreciation). A rising supply of money or the money supply will raise the price of goods as measured by the *terms of money)* and as well as foreign exchange rates, as measured by the domestic currency (Herlambang, et al. 2001)

Research conducted by Brooks (1993) concluded that if the money supply rises it will raise the appreciation of foreign currency (dollars) and it causes depreciation of the local currency (Canadian) and the results of this research study was supported by Alvarez et al. (2002).

Impact of Inflation on Investment

Before deciding to invest, it should be realized that according to the conventional theory investment

depends on the offered nominal interest rate. So the offer could be accepted if the inflation rate as expected (Bodie et al. 2003:141)

$$r \approx R - I \quad (31)$$

Fisher equation states that the nominal interest rate i is equal to the real interest rate $_r\ i$ plus the expected inflation rate Ï € e:

$$i = i_r + \pi^e \quad (32)$$

$$i_r = i - \pi^e \quad (33)$$

Based on these formulations, it can be explained that the increase of inflation will increase the existing interest rate. Gillmant, Max and Michal Kejak (2009), concluded that the relationship between inflation and investment is negative, meaning that if there is an increase in inflation, there will be a decline in the value of investments and vice versa, if there is a decrease in the inflation rate, there will be an increase in the value of investments.

Relationship between Exchange Money by Investing

The results of the study conducted by Campbell et al. (2003), the influence of exchange rates on investment is negative, meaning that if there is an increase in the exchange rate of the local currency against foreign currencies, there will be a decline in the value of investments.

Simultaneous Equation Model (TSLS)

The development of the conceptual framework will provide significant input in determining the existing hypothesis, however, prior to the preparation of the conceptual framework, the framework of thinking process should be made first. Thinking process in the framework of this study is the theory of the money supply, inflation theory, the exchange rate and investment theory.

Testing the hypothesis in a study will produce findings, both of which relate to theoretical and empirical reality. Test results of empirical studies into the basic preparation of the manuscript, will contribute to the development of theory and increase the number of works. In order to validate this hypothesis it is necessary to have statistical test which is matched the research problem appropriately. The hypothesis that has been tested with these statistics will produce some findings, both of which relate to theoretical and empirical reality.

Structural equation model is as follows:

$$Y_1 = \beta_0 + \beta_1 X_1 + \mu_1 \quad (34)$$

$$Y_2 = \delta_0 + \delta_1 X_1 + \mu_2 \quad (35)$$

$$Y_3 = \varphi_0 + \varphi_1 Y_1 + \varphi_3 Y_2 + \mu_3 \quad (36)$$

Description:

X_1 is Total of Money Supply
Y_1 is Inflation
Y_2 is Exchange Rate
Y_3 is Investment

Hypothesis

Based on the background, the formulation of the problem, the study of theory and previous research, the hypotheses are formulated as follows:

1. The money supply has a significant effect on inflation
2. The money supply significantly influences the exchange rate
3. Inflation significantly effects investment
4. The exchange rate significantly influences investment

3. RESEARCH METHOD

Research Design

The approach used in this study belongs to the type of quantitative research because the research starts from theory to analyze the influence between variables that are *observed* through a deductive approach (Wan Usman 2009:4). Beside, this study also analyzes and examines the relationship between exogenous variables and the endogenous variables in the structural equation regression models, which made this study also belong to an explanatory research (Sarmanu 2009:8) and include causal role in this type of research (Kuncoro 2003:10).

Research Data

The type of data is time series data for the period of 1970 to 2012. Time series data is the data that is collected, recorded, or observed at all times in a row. The data are secondary data collected from several agencies, institutions, agencies, and official institutions, such as the Central Bureau of Statistics, Bank Indonesia and IFS *(international financial statistics).*

The available data has been collected, researched, and discussed with the competent authorities in each agency in which the data sources was obtained. Once the data is correct, then the data will be processed in accordance with the method of this study.

Data Analysis Techniques

The relationship, which is analyzed in this study, is the relationship between *exogenous variables* (inflation and exchange rate), *an intervening endogenous variable* (investment) and *the dependent endogenous variable* (economic growth), in which the endogenous variables of this equation can be other *exogenous variables.*

Table 1
Results of Multicollinearity

Coefficients [a]

Model	Unstandardized Coefficients		Stad. Coeff.	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	1.909E7	1.920E7		.994	.327		
IFL	-146649.419	687361.610	- .025	- .213	.832	.816	1.226
NTU	15285.390	2142.622	.777	7134	.000	.978	1.023

Dependent Variable: IVST

Table 2
Result of Test Heterocedascity

Unstandardized Residual	Correlation Coefficient	1.000
	Sig. (2-tailed)	.
	N	39
IFL	Correlation Coefficient	.018
	Sig. (2-tailed)	.912
	N	39
NTU	Correlation Coefficient	.074
	Sig. (2-tailed)	.656
	N	39

Before performing regression analysis using *time series of data,* several tests are needed for all variables first, and then to determine whether the variable is stationary or not, the stationary test is necessary. *Stationary* test is necessary because in general the macroeconomic variables are *nonstationary*. The *stationary* test's purposes is that the *mean* is stable and the random error is 0, so that the regression has the obtained ability models which are reliable and there are no *spurious* (Maddala 1992:526)

It also performed the classic assumption test which includes normality test, heteroskedastic test (Priyatno 2010:84),auto-correlation test (Kendall 1971:8) and multicollinearity test (Winarno 2007:5.7). In order to determine which form of analysis models is used in the conceptual model, the model is identified first. The hypotheses are tested using multiple regressions with Two Stages Least Square methods and the analytical tool used in this study is by Eviews 15.

4. DATA ANALYSIS AND DISCUSSION

Multicollinearity Test

Multicollinearity test is performed on variables of inflation and exchange rate, as these variables are independent variables that affects partially or entirely on investment, the result is as follows:

The existence of multicollinearity can be seen from the VIF value of each independent variable. If the VIF value between each of the independent variables is less than 5, it can be concluded that the regression model did not reveal any multicollinearity problems.

Based on the results of the tests that have been conducted, multicollinearity can be seen in Table 1. It appears that the coefficient of each variable is below 5. Therefore, in the models to be studied, namely inflation, interest rates and exchange rates, the multicollinearity do not occur.

Heteroskedastic Test

Heteroskedastic test aims to test whether the regression model of the *variance* of a residual inequality is occurred from one observation to others observation or not. The results of the heteroskedastic test using the *Test Spearmensrho* is presented as follows:

The Heteroskedastic test, which is done using the Test Spearmenâ € ™ s rhocan, be seen in Table 2. In this test, it is considered the significance of the *unstandardized residual* value with the following procedures:

1. H_0: there is no heteroskedastic
   H_1: there is heteroskedastic
2. By using Î ± Â ± = 5%, reject H_0 P-value <Î ±
3. Because of all the variables P-Value> 0:05 then H_0 is accepted

The conclusion is that the models being studied have 95% confidence level and there is one variable that has a value below the level of confidence, which is the rate of interest variable.

Autocorrelation test

Autocorrelation test aims to detect whether in a linear regression of the model correlation among errors of destruction is occurred or not.

Table 3
Result Autocorrelation Test

Model Summary [b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.814 [a]	.663	.654	4.31274E7	2.038

a. Predictors: (Constant), NTU, IFL

Dependent Variable: IVST

Table 4
Stationary Test Results of Money Supply

Lag	Autocorrelation	Std.error	Box- Ljung Statistic		
			Value	df	Sig
1	-0.100	0.158	0.400	1	0.527
2	0.401	0.156	7.046	2	0.030

Table 5
Stationary Test Results of Interest Rate

Lag	Autocorrelation	Std. error	Box-Ljung Statistic		
			Value	df	Sig
1	-0.317	0,158	4.019	1	0.045
2	-0.437	0.156	11.895	2	0.003

This method is based on the value of *the Durbin-Watson* and it is obtained that the results of the test is presented in Table 3, then with Î ± = 5%, and n = 39 and k = 3, from Table *Durbin-Watson* it is obtained value dU = 1,658 and dL = 1.328. (See Appendix) The value of *the Durbin-Watson* obtained 1,594, because its value is between the values of dL and dU, it does not produce definitive conclusions (located in the area of doubt).

Stationary Test

Before the *time series* of data processing is performed on stage regression, it is necessary to have stationary test to all the variables to determine whether the variables are stationary or not. This is necessary because the *time series* of data in economics are commonly not stationary, so if the test is not done then the variables used in the regression will be estimated as incorrect or *spurious regression.*

The test is performed by using a *unit root* test in order to find out whether the data contains a *unit root* or not. If the variables contain a *unit root,* then the data is defined as not stationary. Full result of the stationary tests that have been done on the variable inflation, exchange rate, and investment and economic growth is presented as follows:

Stationary Test results on the variables of Inflation (IFL)

Stationary test result on the variables of inflation is presented in Table 4.

Stationary Test results on the variables of Inflation (IFL)

Stationary test result on the variables of interest rate is presented in Table 5.

Stationary Test results on Exchange Rate (NTU)

Stationary test result on the exchange rate variable is presented in Table 6.

Stationary Test results on Investment (IVST)

Stationary test result on Investment variables is presented in Table 7.

Test Results between Variables

After testing the classical assumption, the proposed hypothesizes then tested. The result of the statistic test performed on all the variables is generated as follows:

Ordinary Least Square Regression Test
Step 1

Phase 1, Results of regression relationship between the money supply and inflation, using the ordinary least squares, can be viewed in Appendices.

Based on the analysis result, it can be explained that, when either there is a change in the Money Supply, increasing or additions, have meaning, these changes do not affect significantly the inflation. The results of this study is in contradictory with the Quantity Theory which explains that the main source of inflation is due to an excess of money in circulation multiplied (Khalwaty 2000:15-31).

Table 6
Stationary Test Results of Exchange Rate

Lag	Autocorrelation	Std. error	Box-Ljung Statistic		
			Value	df	Sig
1	-0.595	0,158	14.173	1	0.000
2	-0.020	0.156	14.190	2	0.001

Table 7
Stationary Test Results on Investment

Lag	Autocorrelation	Std. Error	Box-Ljung Statistic		
			Value	Df	Sig
1	-0.549	0.158	12.103	1	0.001
2	0.093	0.156	12.460	2	0.002

According to the quantity theory, the increase in the rate of money growth of 1% led to a 1% increase in the rate of inflation (Mankiw 2003:87). The results of this study are also in contrast to the study conducted by Budina et al. (2006) and Power (2005), in those studies it is concluded that the increase in the money supply can elevates the rate of inflation.

The phenomenon of inflation in Indonesia is not merely a short-term phenomenon and occurs occasionally as commonly happen in other developing countries. The problem of inflation in Indonesia is a long-term inflation problem since it occurs due to the structural constraints in the country's economy. Thus, the action toward the problems of inflation in Indonesia is not enough to use the short term monetary instruments, but also to make improvements in the real sector, i.e. to reduce and eliminate the factors that structurally inhibit existed in the national economy.

As it is known that, the onset of inflation can be derived from the demand side and the supply side. Specific task carried out by the Central Bank, in this case *Bank Indonesia*, is to control inflation from the demand side, such as investment and private consumption. For example, the policy of interest rate increasing will control the public and government in spending which then reduces the aggregate demand, which in turn can reduce inflation. In addition to the increase of interest rates that could also strengthen the exchange rate through an increase in *the interest rate differential* and *Bank Indonesia* may affect public expectations through consistent and credible policies.

The cause of the other side is the supply side; this condition is beyond the control of the Central Bank. The cause of the supply-side comes from *cost-push inflation*. These indications are usually characterized by the rising of raw material prices and the decline in industrial production. This condition is usually preceded by a decrease in *aggregate supply* as the result of the increased cost of production. These events have occurred in 1972 and 1973 in which the oil crisis which led to the rise in oil prices.

Step 2

Phase 1 Results of regression relationship between the money supply and the rate of money by using Ordinary Least Square analysis, can be viewed in Appendices.

The money supply is chosen as an instrument of monetary control because of the amount of base money, which is in control of monetary authoritarian. Assuming that the *money multiplier* is stable and predictable well, the increase in the money supply will affect the existing exchange rate movements.

Reserve circulation of foreign exchange (balance of payments) arises as a result of excess demand or supply of money. If there is excess supply money then the balance of payments will be deficit, and vice versa. If there is excessive demand for money, the balance of payments will be surplus. Excess money supply will lead to people spending the excess, for example, to import or purchase foreign banknotes resulting in the flow of foreign capital out, which means that the demand for foreign exchange is increased while demand for its own currency is decreased, this will result in the appreciation of exchange rate.

Two Stages Least Squares Test

Step 1

In the next stage, phase 2 test is conducted using TSLS method for the relationship between inflation predictors and the investment, the result can be seen in Appendices.

Based on the results of statistical analysis, it shows that inflation significantly influences the investment. The result of this finding is supported by research conducted by Gillmant, Max and

Michal Kejak (2009).It is concluded that the relationship between inflation and investment is negative, meaning that if there is an increase in the inflation there will be a decrease in the value of investments. This is because when inflation is high then all construction costs will be high and this will reduce the interest of investors because it costs higher than it planned.

Step 2

In the next stage, Phase 2 test is conducted using TSLS method for predictors of the relationship between the exchange rate and the investment. The result can be seen in Appendices.

As an open economy, the exchange rate is one of the factors that affect the performance of the economy in general. The Effect of exchange rate on the economy is in two sides, namely the demand and supply side. On the demand side of the exchange rate depreciation will cause the price of foreign goods is relatively higher than domestic goods. This will increase the demand for domestic goods both from domestic and foreign demand towards exports.

Analysis of the demand side is enriched with the *Marshall-Lener Condition* concept of price elasticity, in which the exchange rate depreciation would increase the net number of exports and import if price elasticity is bigger than one (Husman 2005). From the demand side in addition that it is affected by exchange rate movements, the movement of *the output* is also closely related to monetary policy and fiscal policy. Expansion of monetary policy will decrease the interest rates which further can increase investment and *output*.

On the other hand, from the supply side depreciation will increase the cost of imported raw materials, which in turn can lead to a decreasing in *output* production, so that the net effect of the depreciation of the exchange rate of the *output* depends on the relative strength of both supply and demand sides.

Simultaneous relationship between Inflation and Money Exchange Rate on investment can be explained in Appendices.

Based on the results of the regression analysis that is performed among predictors of inflation, exchange rate predictor with the investment, it obtained a value of *Adjusted R-squared* 0.725. These finding shows that indicators of inflation and exchange rates simultaneously affect the investment of 72.5%, while the remaining 27.5% is influenced by other factors which are not examined.

The influx of investment in a country is determined by the competitiveness of the country to another country. Competitiveness of the country was formed in addition to economic factors as well as by non-economic factors including infrastructure, political and institutional, social and cultural. The success of the state to enhance the competitiveness of the investment depends on the ability of these countries to formulate policies related to investment and business, as well as improving the quality of public service, human resource development and infrastructure in the broad sense.

5. CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

In general, it can be concluded that stability on the money supply is very important because if the money supply is too much it will affect the investment. This is because if the money supply is too much it will cause the fall of the exchange rate, which then affect the investment.

Although the amount of money in circulation does not significantly affect inflation, it can significantly affect the investment. This means that the stability of amount of money in circulation requires maintaining in order to avoid over-supply. Besides that, it makes the acceleration of investment run smoothly so that the factors which affect competitiveness should be minimized.

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APPENDICES

Dependent Variable: IFL
Method: Least Squares
Date: 08/10/13 Time: 12:10
Sample: 1970 2012
Included observations: 38 after adjusting endpoints
Excluded observations: 1

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
JUBM1	-2.54E-05	3.86E-05	-0.657768	0.5149
C	13.17410	2.518452	5.231029	0.0000
R-squared	0.011876	Mean dependent var		12.26474
Adjusted R-squared	-0.015572	SD dependent var		12.87663
SE of regression	12.97651	Akaike information criterion		8.015354
Sum squared resid	6062.031	Schwarz criterion		8.101543
Log likelihood	-150.2917	F-statistic		0.432658
Durbin-Watson stat	2.021673	Prob (F-statistic)		0.514872

Dependent Variable: NTU
Method: raced Squares
Date: 08/10/13 Time: 12:07
Sample: 1970 2012
Included observations: 38 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
JUBM1	0.059227	0.005612	10.55404	0.0000
C	1351.182	361.5180	3.737524	0.0006
R-squared	0.750653	Mean dependent var		3447.477
Adjusted R-squared	0.743914	SD dependent var		3727.693
SE of regression	1886.396	Akaike information criterion		17.97264
Sum squared resid	1.32E +08	Schwarz criterion		18.05796
Log likelihood	-348.4666	F-statistic		111.3877
Durbin-Watson stat	0.573765	Prob (F-statistic)		0.000000

Dependent Variable: IVST
Method: Least Squares
Date: 08/10/13 Time: 12:27
Sample (adjusted): 1970 2012
Included observations: 38 after adjusting endpoints

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
IFLPREDIC	-42007776	5,079,227.	-8.270506	0.0000
C	5.70E +08	62691114	9.088340	0.0000
R-squared	0.655177	Mean dependent var		54543926
Adjusted R-squared	0.645598	SD dependent var		72824897
SE of regression	43353869	Akaike information criterion		38.05889
Sum squared resid	6.77E +16	Schwarz criterion		38.14507
Log likelihood	-721.1188	F-statistic		68.40126
Durbin-Watson stat	1.626611	Prob (F-statistic)		0.000000

Dependent Variable: IVST
Method: Least Squares
Date: 08/10/13 Time: 12:37
Sample: 1970 2012
Included observations: 38 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NTUPREDIC	18023.29	2268.014	7.946725	0.0000
C	-5,272,251.	10649640	-0.495064	0.6235
R-squared	0.630556	Mean dependent var		56862592
Adjusted R-squared	0.620571	SD dependent var		73304659
SE of regression	45154076	Akaike information criterion		38.13898
Sum squared resid	7.54E +16	Schwarz criterion		38.22429
Log likelihood	-741.7101	F-statistic		63.15043
Durbin-Watson stat	2.032998	Prob (F-statistic)		0.000000

Dependent Variable: IVST
Method: Least Squares
Date: 08/10/13 Time: 12:40
Sample (adjusted): 1970 2012
Included observations: 38 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NTUPREDIC	91027.08	30409.14	2.993412	0.0050
IFLPREDIC	1.38E +08	60391290	2.289136	0.0282
C	-1.93E +09	8.37E +08	-2.305852	0.0272
R-squared	0.725462	Mean dependent var		54543926
Adjusted R-squared	0.709774	SD dependent var		72824897
SE of regression	39232658	Akaike information criterion		37.88357
Sum squared resid	5.39E +16	Schwarz criterion		38.01286
Log likelihood	-716.7879	F-statistic		46.24352
Durbin-Watson stat	1.506197	Prob (F-statistic)		0.000000